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SMART & BIGGAR
P.O. BOX 2999, STATION D
900-55 METCALFE STREET
OTTAWA, ON K1P5Y6
CANADA

EXAMINER	
GHULAMALI, QUTBUDDIN	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/038,916	**Applicant(s)** JIA ET AL.	
	Examiner Qutbuddin Ghulamali	**Art Unit** 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16,18-32,34-38,40 and 41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *18-32,34 and 35* is/are allowed.

6)☒ Claim(s) *1-16,36,40 and 41* is/are rejected.

7)☒ Claim(s) *37, 38* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Acknowledgement

1. This Office Action is responsive to the Amendment filed 02/26/2008.

2. The applicant's amendment of claims 38, and 40, is hereby acknowledged and claim objection and rejection is withdrawn.

Response to Arguments

3. Applicant's arguments filed 2/26/2008 have been fully considered but they are not persuasive. Applicant remarks (page 15-16) that Lucas does not disclose or provide an indication of the quality of the channel. The examiner disagrees with the inferences applicant draws in his argument to the art of Lucas. Applicant admits that Lucas output of correlator 33 is disclosed to represent "an estimation of the channel response along the tested path". As pointed out by the examiner, Lucas indeed discloses a correlator (fig. 1, elements 30, 10, 20) which calculates the corresponding sequences (received input and spreading sequence Ck) to produce an estimation of the channel response (quality) along the tested path (col. 4, lines 35-64; col. 5, lines 15-27). The applicant further remarks (page 16) that the correlator in Lucas is less relevant to the correlator of Stein. It has already been debated previously that the correlations calculated in Stein may not result in channel quality indicators and therefore not considered to be relevant in light of Lucas as Lucas shows that the correlator provides an estimation of the

channel response based on quality of the channel because correlator 33 calculates the correlation between a transmitted sequence (bits) and the received signal.

Applicant further remarks (page 17) that the relevance of ten Brink is not clear. The examiner notes that when a work in one field of endeavor, design incentives and other factors can prompt variations of it, either in the same field or a different one and if a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. As per applicant's remarks (page 18-19) regarding motivation to combine, it is reminded to the applicant that the strongest rationale for combining references is a recognition, expressly or impliedly in the prior art or drawn from a convincing line of reasoning based on established scientific principles or legal precedent, that some advantage or expected beneficial result would have been produced by their combination. In re Sernaker, 702 F. 2d 989, 994-95, 217 USPQ 1, 5-6 (Fed. Cir. 1983). In this case, ten Brink, Stein and Lucas disclose the advantage for such combination by disclosing the concept of correlation to produce a channel response quality indicator imposed at the site of transmitter to produce synchronized sequence for a spreading sequence. The examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See In re Fine, 837 F. 2d 1071, 5 USPQ 2d 1596 (Fed. Cir.1988) and In re Jones, 958 F. 2d 347, 21 USPQ 2d 1941 (Fed. Cir. 1992). In this case, ten Brink, Stein and Lucas are analogous art because they are from the same problem solving,

encoding and correlating input sequence to produce quality channel indication. In response to applicant's remarks against combining the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See In re Keller, 642 F. 2d 413,208 USPQ 871 (CCPA 1981); In re Merck & Co., 800 F. 2d 1091,231 USPQ 375 (Fed. Cir. 1986).
As per applicant's remarks (page 20) regarding prior art of Agee and Tiedemann used in the rejection of claim 36, the examiner considers applicant's remarks as irrelevant, because as previously noted, Tiedemann discloses re-encoding the fast signalling message so as to generate pilot symbols in the scattered pattern (page 3, section 0044, lines 13-29); and recovering a channel response for the encoded symbols using decision (compares the reencoded symbols with the demodulated signal to obtain an estimate to control processor) feedback (page 3, section 0044, lines 20-29, section 0045), and a person of ordinary skill in the art at the time the invention was made would be motivated to use the teachings of Tiedemann for re-encoding the fast signalling message so as to generate pilot symbols in the scattered pattern, and recovering a channel response for the encoded symbols using decision feedback, because it can allow control of power in the transmission of symbols and mitigate the impact of random errors in the system of Agee..
As per applicant's remarks (page 21) regarding rejection of claims 40 and 41, the examiner considers such remarks out of context and irrelevant because the examiner never relied on art to Thomas et al for claim rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 11, are rejected under 35 U.S.C. 103(a) as being unpatentable over ten Brink (US patent 6,611,513) in view of Stein (USP 6,175,590) and Lucas (USP 5,448,600) and further in view of Balachandran et al (USP 6,215,827).

Regarding claims 1 and 11, Brink discloses a transmitter and a receiver adapted to transmit and receive comprising:

a symbol de-mapper (fig. 3, element 24), receiving as input a sequence of received symbols over the channel whose quality is to be measured, said symbol de-mapper being adapted to perform symbol de-mapping on said sequence of received symbols to produce a sequence of soft data element decisions (see abstract, page 1, lines 63-67; page 2, lines 1-3; page 4, lines 60-67; page 5, lines 10-20);

a soft decoder, receiving as input the sequence of soft data element decisions produced by the symbol de-mapper, said soft decoder being adapted to decode the sequence of soft data element decisions to produce a decoded output sequence (page 5, lines 22-38).

Brink, however does not explicitly disclose, an encoder, receiving as input the decoded output sequence produced by the soft decoder, said encoder being adapted to re-

encode the decoded output sequence with an identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence; and

a correlator receiving as input the sequence of soft data elements to produce a channel quality indicator output by determining a correlation between the sequence of soft data element decisions and the re-encoded output sequence.

Stein, in a similar field of endeavor discloses:

an encoder (236), receiving as input the decoded output (230) sequence produced by the soft decoder, said encoder being adapted to re-encode the decoded output sequence with an identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence (col. 5, lines 57-67; col. 6, lines 1-24); and

a correlator, receiving as input the sequence of soft data element decisions produced by the symbol de-mapper, and the re-encoded output sequence produced by the encoder, said correlator determining a correlation between the sequence of soft data element decisions and the re-encoded output sequence (col. 3, lines 1-16). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use an encoder to re-encode the decoded output sequence with an identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence, and a correlator to determining a correlation between the sequence of soft data element decisions and the re-encoded output sequence as taught by Stein in the system of Brink because the re-encoding can provide a higher rate of confidence with

the received data and a correlator for correlation between sequences can indicate that no error exists in the received data frame.

Brink and Stein even though disclose limitation as recited above, however, fail to disclose correlator being adapted to produce a channel quality indicator. Lucas, however, discloses correlator (fig. 1, elements 30, 10, 20), which calculates the corresponding sequences (received input and spreading sequence Ck) to produce an estimation of the channel response (quality) along the tested path (col. 5, lines 15-27, 33-45). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize channel quality estimation or indicator as taught by Lucas in the combined system of Brink and Stein because it can provide a better correlation between sequences and allow recovery of transmitted information bits.

Even though Brink, Stein and Lucas combined, disclose limitations as recited above, do not explicitly disclose apparatus adapted to feed the channel quality indicator back to a transmitter for use in determining and applying appropriate coding and modulation to the source data element sequence. However, Balachandran, in a similar field of endeavor discloses apparatus adapted to feed the channel quality indicator (the channel quality indication is in terms of signal to interference and noise ratio (SIR) (col. 1, lines 30-33, 44-50) back to a transmitter for use in determining and applying appropriate coding and modulation to the source data element sequence (col. 13, lines 65-67; col. 14, lines 1-44). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use feedback of quality channel indications back to a transmitter as taught by Balachandran in the combined system of Brink, Stein and

Lucas because the channel quality determination feedback to transmitter can allow efficient and accurate rate adjustment at transmission of coded communication data signal.

6. Claims 2, 3, 12, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brink (USP 6,611,513) in view of Stein (USP 6,175,590), Lucas (USP 5,448,600) and Balachandran et al (USP 6,215,827), and further in view of Jones et al (USP 6,215,813).

Regarding claims 2, 3, 12 and 13 Brink, Stein, Lucas and Balanchandran combined disclose all of limitations of the claim above. The combination however, is silent regarding symbol de-mapper is adapted to perform QPSK symbol de-mapping and Euclidean distance. However, Jones, in a similar field of endeavor discloses a symbol de-mapper is adapted to perform QPSK symbol de-mapping and least squared Euclidean distance to the transmission symbol from the received symbol. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use QPSK symbol de-mapping and least squared Euclidean distance as taught by Jones in the combined system of Brink, Stein, Lucas and Balachandran because it can enhance bandwidth and performance in efficiency in the system with relatively high processing gain.

7. Claim 4, is rejected under 35 U.S.C. 103(a) as being unpatentable over ten Brink (US patent 6,611,513) in view of Stein (USP 6,175,590) and Lucas (USP 5,448,600) and further in view of Balachandran et al (USP 6,215,827).

Regarding claim 4, Brink discloses a transmitter and a receiver adapted to transmit and receive comprising:

a symbol de-mapper (fig. 3, element 24), receiving as input a sequence of received symbols over the channel whose quality is to be measured;

symbol de-mapping (de-mapper) said sequence of received symbols to produce a sequence of soft data element decisions (see abstract, page 1, lines 63-67; page 2, lines 1-3; page 4, lines 60-67; page 5, lines 10-20);

decoding sequences of soft data element decisions to produce a decoded output sequence (a soft value on information bits, fig. 3, elements 26, 27, 28) (col. 5, lines 22-38).

Brink, however does not explicitly disclose, re-encoding decoded output sequence to produce a re-encoded output sequence, using a code identical code to a code used in encoding the source data element sequence. to produce a re-encoded output sequence; and

a correlator receiving as input the sequence of soft data elements to produce a channel quality indicator output by determining a correlation between the sequence of soft data element decisions and the re-encoded output sequence.

Stein, in a similar field of endeavor discloses:

re-encoder (236), receiving as input the decoded output (230) sequence produced by the soft decoder, said re-encoder being adapted to re-encode the decoded output sequence with an identical code to a code used in encoding the source data element

sequence to produce a re-encoded output sequence (col. 5, lines 57-67; col. 6, lines 1-24);

a correlator (234), correlating re-encoded output sequence and sequence of soft data element decisions (col. 3, lines 1-16). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a re-encoder to re-encode the decoded output sequence with an identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence, and a correlator to determining a correlation between the sequence of soft data element decisions and the re-encoded output sequence as taught by Stein in the system of Brink because the re-encoding can provide a higher rate of confidence with the received data and a correlator for correlation between sequences can indicate that no error exists in the received data frame. Brink and Stein, however, do not explicitly disclose correlator to produce a channel quality indicator output. However, Lucas discloses correlator (fig. 1, elements 30, 10, 20), which calculates the corresponding sequences (received input and spreading sequence Ck) to produce an estimation of the channel response (quality) along the tested path (col. 5, lines 15-27, 33-45). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize channel quality estimation or indicator as taught by Lucas in the combined system of Brink and Stein because it can provide a better correlation between sequences and allow recovery of transmitted information bits. Even though Brink, Stein and Lucas combined, disclose limitations as recited above, do not explicitly disclose apparatus adapted to feed the channel quality indicator back to a transmitter for use in determining and applying

appropriate coding and modulation to the source data element sequence. However, Balachandran, in a similar field of endeavor discloses apparatus adapted to feed the channel quality indicator (the channel quality indication is in terms of signal to interference and noise ratio (SIR) col. 1, lines 30-33, 44-50) back to a transmitter for use in determining and applying appropriate coding and modulation to the source data element sequence (col. 13, lines 65-67; col. 14, lines 1-44). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use feedback of quality channel indications back to a transmitter as taught by Balachandran in the combined system of Brink, Stein and Lucas because the channel quality determination feedback to transmitter can allow efficient and accurate rate adjustment at transmission of coded communication data signal.

8. Claims 5, 6, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brink (USP 6,611,513) in view of Stein (USP 6,175,590) and Lucas (USP 5,448,600) and Balachandran et al (USP 6,215,827) and further in view of Jones et al (USP 6,215,813).

Regarding claims 5, 6, 15 and 16, Brink, Stein, Lucas and Balachandran combined disclose all limitations of the claim. The combination however, does not explicitly disclose symbol de-mapper is adapted to perform QPSK symbol de-mapping and Euclidean distance. Jones in a similar field of endeavor discloses a symbol de-mapper is adapted to perform QPSK symbol de-mapping and least squared Euclidean distance to the transmission symbol from the received symbol. Therefore, it would have

been obvious to one of ordinary skill in the art at the time the invention was made to use QPSK symbol de-mapping and least squared Euclidean distance as taught by Jones in the system of Brink, Stein, Lucas and Balachandran because it can enhance performance in bandwidth and system efficiency with relatively high processing gain.

9. Claim 7, is rejected under 35 U.S.C. 103(a) as being unpatentable over ten Brink (US patent 6,611,513) in view of Stein (USP 6,175,590) and Lucas (USP 5,448,600) and further in view of Balachandran et al (USP 6,215,827).

Regarding claim 7, Brink discloses a transmitter and a receiver adapted to transmit and receive comprising:

a symbol de-mapper (fig. 3, element 24), receiving as input a sequence of received symbols over the channel whose quality is to be measured;

symbol de-mapping (de-mapper) said sequence of received symbols to produce a sequence of soft data element decisions (see abstract, page 1, lines 63-67; page 2, lines 1-3; page 4, lines 60-67; page 5, lines 10-20);

decoding sequences of soft data element decisions to produce a decoded output sequence (a soft value on information bits, fig. 3, elements 26, 27, 28) (col. 5, lines 22-38).

Brink, however does not explicitly disclose, re-encoder decoded output sequence to produce a re-encoded output sequence, using a code identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence; and

a correlator receiving as input the sequence of soft data elements to produce a channel quality indicator output by determining a correlation between the sequence of soft data element decisions and the re-encoded output sequence.

Stein, in a similar field of endeavor discloses:

re-encoder (236), receiving as input the decoded output (230) sequence produced by the soft decoder, said re-encoder being adapted to re-encode the decoded output sequence with an identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence (col. 5, lines 57-67; col. 6, lines 1-24);

a correlator (234), correlating re-encoded output sequence and sequence of soft data element decisions (col. 3, lines 1-16). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a re-encoder to re-encode the decoded output sequence with an identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence, and a correlator to determining a correlation between the sequence of soft data element decisions and the re-encoded output sequence as taught by Stein in the system of Brink because the re-encoding can provide a higher rate of confidence with the received data and a correlator for correlation between sequences can indicate that no error exists in the received data frame. Brink and Stein, however, do not explicitly disclose correlator to produce a channel quality indicator output. However, Lucas discloses correlator (fig. 1, elements 30, 10, 20), which calculates the corresponding sequences (received input and spreading sequence Ck) to produce an estimation of the channel response (quality)

along the tested path (col. 5, lines 15-27, 33-45). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize channel quality estimation or indicator as taught by Lucas in the combined system of Brink and Stein because it can provide a better correlation between sequences and allow recovery of transmitted information bits. Even though Brink, Stein and Lucas combined, disclose limitations as recited above, do not explicitly disclose apparatus adapted to feed the channel quality indicator back to a transmitter for use in determining and applying appropriate coding and modulation to the source data element sequence. However, Balachandran, in a similar field of endeavor discloses apparatus adapted to feed the channel quality indicator (the channel quality indication is in terms of signal to interference and noise ratio (SIR) col. 1, lines 30-33, 44-50) back to a transmitter for use in determining and applying appropriate coding and modulation to the source data element sequence (col. 13, lines 65-67; col. 14, lines 1-44). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use feedback of quality channel indications back to a transmitter as taught by Balachandran in the combined system of Brink, Stein and Lucas because the channel quality determination feedback to transmitter can allow efficient and accurate rate adjustment at transmission of coded communication data signal.

10. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brink (USP 6,611,513) in view of Stein (USP 6,175,590), Lucas (USP 5,448,600) and

Balachandran et al (USP 6,215,827), and further in view of Thomas (US Pub. 2002/0051498).

Regarding claim 8, Brink, Stein, Lucas and Balanchandran combined disclose all of limitations of the claim above. The combination however, is silent regarding symbol de-mapper is adapted to perform QPSK symbol de-mapping and Euclidean distance. However, Thomas, in a similar field of endeavor discloses a symbol de-mapper is adapted to perform QPSK symbol de-mapping and least squared Euclidean distance to the transmission symbol from the received symbol. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use QPSK symbol de-mapping and least squared Euclidean distance as taught by Thomas in the combined system of Brink, Stein, Lucas and Balachandran because it can enhance bandwidth and performance in efficiency in the system with relatively high processing gain.

Regarding claim 9, Brink, Stein, Lucas and Balanchandran in combination disclose all limitations of the claim except, does not explicitly show said sequence of received symbols comprises Euclidean distance conditional LLR de-mapping. Thomas in a similar field of endeavor discloses sequence of received symbols comprises Euclidean distance conditional LLR de-mapping (page 4, section 0062). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Euclidean distance conditional LLR de-mapping as taught by Thomas in the combined art of Brink, Stein, Lucas and Balanchandran because it can minimize error rate in the transmission of signals and optimize synchronization.

With reference to claim 10, Brink, Stein, Lucas and Balanchandran in combination disclose all limitations of the claim except, does not explicitly show decoding of sequence of soft data element decisions to produce output sequence further comprises using a history of the soft data element decisions, and using information about encoding of the sequence of symbols transmitted over the channel. Thomas in a similar field of endeavor discloses decoding of sequence of soft data element decisions to produce output sequence further comprises using a history of the soft data element decisions, and using information about encoding of the sequence of symbols transmitted over the channel (page 6, section 0090). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Euclidean distance conditional LLR de-mapping as taught by Thomas in the combined art of Brink, Stein, Lucas and Balanchandran because it can minimize error rate in the transmission of signals and optimize transmission time.

11. Claim 14, is rejected under 35 U.S.C. 103(a) as being unpatentable over ten Brink (US patent 6,611,513) in view of Stein (USP 6,175,590) and Lucas (USP 5,448,600) and further in view of Balachandran et al (USP 6,215,827).

Regarding claim 14, Brink discloses a method of modulation and coding (encoding) comprising:

transmitting (fig. 3, element 10) over a channel a sequence of symbols produced by encoding (encoder 11) and constellation mapping a source data element sequence (col. 4, lines 60-67; col. 5, lines 1-10);

receiving a sequence of received symbols over the channel (see abstract, page 1, lines 63-67; page 2, lines 1-3; page 4, lines 60-67; page 5, lines 10-20);

symbol de-mapping (fig. 3, element 24), said sequence of received symbols to produce to produce a sequence of soft data element decisions (see abstract, page 1, lines 63-67; page 2, lines 1-3; page 4, lines 60-67; page 5, lines 10-20);

decoding said sequence of soft data element decisions to produce a decoded output sequence (page 5, lines 22-38).

Brink, however does not explicitly disclose, an encoder, re-encoding decoded output sequence to produce a re-encoded output sequence using a code identical to a code used in encoding the source data element sequence;

correlating the re-encoded output sequence, and sequence of soft data element decisions to produce a channel quality indicator output;

transmitting the channel quality indicator; and using the channel quality indicator to determine and apply an appropriate coding rate and modulation to the source data element sequence.

Stein, in a similar field of endeavor discloses:

re-encoder (236), receiving as input the decoded output (230) sequence produced by the soft decoder, said re-encoder being adapted to re-encode the decoded output sequence with an identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence (col. 5, lines 57-67; col. 6, lines 1-24);

a correlator (234), correlating re-encoded output sequence and sequence of soft data element decisions (col. 3, lines 1-16). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a re-encoder to re-encode the decoded output sequence with an identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence, and a correlator to determining a correlation between the sequence of soft data element decisions and the re-encoded output sequence as taught by Stein in the system of Brink because the re-encoding can provide a higher rate of confidence with the received data and a correlator for correlation between sequences can indicate that no error exists in the received data frame. Brink and Stein, however, do not explicitly disclose correlator to produce a channel quality indicator output. However, Lucas discloses correlator (fig. 1, elements 30, 10, 20), which calculates the corresponding sequences (received input and spreading sequence Ck) to produce an estimation of the channel response (quality) along the tested path (col. 5, lines 15-27, 33-45). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize channel quality estimation or indicator as taught by Lucas in the combined system of Brink and Stein because it can provide a better correlation between sequences and allow recovery of transmitted information bits. Even though Brink, Stein and Lucas combined, disclose limitations as recited above, do not explicitly disclose apparatus adapted to feed the channel quality indicator back to a transmitter for use in determining and applying appropriate coding and modulation to the source data element sequence. However, Balachandran, in a similar field of endeavor discloses apparatus adapted to feed the

channel quality indicator (the channel quality indication is in terms of signal to interference and noise ratio (SIR) col. 1, lines 30-33, 44-50) back to a transmitter for use in determining and applying appropriate coding and modulation to the source data element sequence (col. 13, lines 65-67; col. 14, lines 1-44). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use feedback of quality channel indications back to a transmitter as taught by Balachandran in the combined system of Brink, Stein and Lucas because the channel quality determination feedback to transmitter can allow efficient and accurate rate adjustment at transmission of coded communication data signal.

12. Claim 36, is rejected under 35 U.S.C. 103(a) as being unpatentable over Agee et al (US patent 6,621,851) in view of Tiedemann, JR. et al (US Pub. 2006/0094460).

Regarding claim 36, Agee discloses a method of generating pilot symbols from an OFDM frame in a receiver comprising:

processing the encoded symbols based on a scattered pattern to recover the encoded fast signaling message (col. 7, lines 54-64; col. 17, lines 50-60; col. 23, lines 31-37, 61-67; col. 24, lines 1-2). Agee does not explicitly show re-encoding recovered fast signalling message so as to produce known pilot symbols in the scattered pilot pattern; and

determining a channel response for the encoded symbols using decision feedback. However, Tiedemann in a similar field of endeavor discloses re-encoding the fast signalling message so as to generate pilot symbols in the scattered pattern (page 3,

section 0044, lines 13-29); and determining a channel response for the encoded symbols using decision (compares the reencoded symbols with the demodulated signal to obtain an estimate to control processor) feedback (page 3, section 0044, lines 20-29, section 0045). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use re-encoding the fast signalling message so as to generate known pilot symbols in the scattered pattern, and determining a channel response for the encoded symbols using decision feedback as taught by Tiedemann in the system of Agee because it can allow control of power in the transmission of symbols and mitigate the impact of random errors.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

14. Claims 40-41 are rejected under 35 U.S.C. 102 (e) as being anticipated by Walton et al (US Pub. 2006/0105761).

Regarding claim 40, Walton discloses a transmitter wherein a set of transmission parameter signaling symbols are transmitted on the overhead channel (data channel)

with strong encoding (increased reliability) such that at a receiver, they can be decoded accurately, re-encoded, and the re-encoded symbols treated as known pilot symbols which can then be used for channel estimation (page 9, section 0100, 0101; page 10, section 0103, 0104; page 11, section 0112).

Regarding claim 41, Walton discloses a receiver adapted to decode a received signal containing the encoded transmission parameter signaling symbols as modified by a channel, re-encode the decoded symbols to produce known pilot, compare the received symbols with the known pilot symbols to produce a channel estimate (page 9, section 0100, 0101; page 10, section 0103, 0104; page 11, section 0112).

Allowable Subject Matter

15. Claims 18-32, 34 and 35 allowed.

16. Claims 37, 38 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

17. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutbuddin Ghulamali whose telephone number is (571)-272-3014. The examiner can normally be reached on Monday-Friday, 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QG.
May 24, 2008.

/CHIEH M FAN/
Supervisory Patent Examiner, Art Unit 2611